

DETAILED ACTION

1. This office action is in response to amendment filed 8/21/2008. Claims 1-6 are amended and pending in the present application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Applicant's amendments to Abstract and Specification to correct inadvertent errors is acknowledged.

Claim Objections

4. Claims 2-3 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 2 recites a molecular weight of 2000 and is outside the range for "monomer V" with $n = 90$ to 300. When $n = 90$ the molecular weight of monomer V is about 4078 g/mol ($X = CH_3$) and about 4050 g/mol ($X = H$).

Claim 3 recites a molecular weight of 11800 which is outside the range for "monomer VI" with $m = 2$ to 50. When $n = 50$, the molecular weight of monomer VI is about 3058 g/mol ($X = CH_3$) and about 3034 g/mol ($X = H$).

Claim Rejections - 35 USC § 112

5. Claims 1-6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1 recites an "n" value of from 90 to 300. While there is support for "n" having a value higher than 90, there is no support for "n" having a value of 90 in the originally filed disclosure.

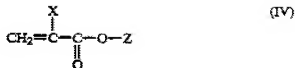
Claims 2-6 are subsumed by this rejection.

Claim Rejections - 35 USC § 103

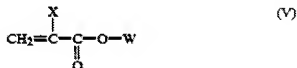
6. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cerulli et al (US 5, 362,324) in view of Yuasa et al (US 6, 486, 260 B1).

Cerulli et al disclose a superplasticizing additive for concrete which is a terpolymer of a mixture of the monomer having the formula IV, V and VI (column 9, lines 34-54; column 10, lines 22-34) -

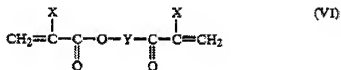
Art Unit: 1796



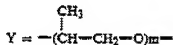
where $\text{Z}=\text{H}, \text{Na}, \text{Li}, \frac{1}{2}\text{Ca}$ and X is H or CH_3 ;



where $\text{W}=\text{---}(\text{---CH}_2\text{---CH}_2\text{---O---})_n\text{---CH}_3$, n is an integer from 8 to 50 and X is H or CH_3 ;



where



and m is an integer from 2 and 50.

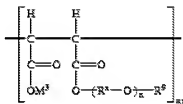
The monomer of formula V is polyethyleneglycolmonomethylether-(meth)acrylate of molecular weight from about 200 to 2000. The monomer of formula VI is polypropyleneglycol-di-(meth)acrylate of molecular weight of about 280 to 3100. The amount of acrylic monomers IV and V ranges from 90 to 99.9 percent of the whole polymerized mass and the amount of monomer (VI) ranges from 0.1 to 10 percent of the whole polymerized mass. Cementitious mixture contains from about 0.01 to 3.00

Art Unit: 1796

percent by weight of the additive (column 10, lines 35-50). See examples for the weight ratio between acrylic monomers IV and V.

Cerulli et al differs with respect to "n" value of monomer V.

However, Yuasa et al teach polycarboxylic acid polymer as a cement additive (abstract) and comprises repeating units "C" represented by general formula -

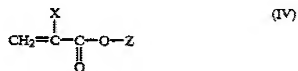


wherein the average number of moles of an oxyalkylene group is not less than 110 (column 3, lines 66-67; column 4, lines 1-45). Required level of dispersibility and steric repulsion towards cement cannot be obtained if the number of oxyalkylene groups, which are repeating units of the polyalkylene glycol, is not more than 100 (column 1, lines 50-55). The repeating unit "C" serves an important function in allowing the cement composition to show dispersibility owing to the hydrophilicity of oxyalkylene groups and the steric repulsion resulting therefrom (column 8, lines 30-34). For avoiding substantial impairment in the hydrophilicity of oxyalkylene group and thus allowing cement compositions to satisfactorily exhibit their dispersibility, the group R^{\oplus} is preferably a methyl (column 9, lines 18-21). Therefore, it would have been obvious to one skilled in the art at the time invention was made to use polyalkylene glycol monomethyl ether wherein the number of oxyalkylene groups is at least 110, for obtaining required level of dispersibility owing to the hydrophilicity of oxyalkylene groups and the steric repulsion resulting therefrom.

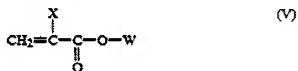
Art Unit: 1796

7. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cerulli et al (US 5, 362,324) in view of Satoh et al (US 5, 911, 820).

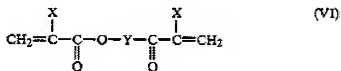
Cerulli et al disclose a superplasticizing additive for concrete which is a terpolymer of a mixture of the monomer having the formula IV, V and VI (column 9, lines 34-54; column 10, lines 22-34) -



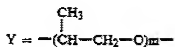
where $Z = \text{H, Na, Li, } \frac{1}{2}\text{Ca}$ and X is H or CH_3 ;



where $W = -(-CH_2-CH_2-O-)_n-CH_3$, n is an integer from 8 to 50 and X is H or CH_3 ;



where



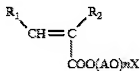
and m is an integer from 2 and 50.

Art Unit: 1796

The monomer of formula V is polyethyleneglycolmonomethylether-(meth)acrylate of molecular weight from about 200 to 2000. The monomer of formula VI is polypropyleneglycol-di-(meth)acrylate of molecular weight of about 280 to 3100. The amount of acrylic monomers IV and V ranges from 90 to 99.9 percent of the whole polymerized mass and the amount of monomer (VI) ranges from 0.1 to 10 percent of the whole polymerized mass. Cementitious mixture contains from about 0.01 to 3.00 percent by weight of the additive (column 10, lines 35-50). See examples for the weight ratio between acrylic monomers IV and V.

Cerulli et al differs with respect to "n" value of monomer V.

However, Satoh et al teach concrete admixture which is effective in imparting fluidity to a hydraulic composition such as cement and comprises structural units derived from an ethylenically unsaturated monomer (a) having 25 to 300 moles of C₂-C₃ oxyalkylene group (abstract). The ethylenically unsaturated monomer having 25 to 300 moles of C₂-C₃ oxyalkylene group is represented by the formula -



wherein R₁ and R₂ are each hydrogen atom or methyl and AO is a C₂-C₃ oxyalkylene group, n is a number of 25 to 300 and X is a C₁-C₃ alkyl group (column 3, lines 5-25). When the copolymer has lengthened side chains by an increase in the mole number of oxyalkylene groups added, it exhibits an enhanced dispersing effect due to steric repulsion and therefore can impart fluidity even when a reduced amount is used. Therefore, surface hydration of cement is little hindered (column 2, lines 62-67). It is preferable from the view point of not causing any retardation of hardening of concrete that the number of oxyalkylene group is particularly 110 or above. When the number

exceeds 300, resulting copolymer will exhibit poor dispersing effect (column 3, lines 38-43). Therefore, it would have been obvious to one skilled in the art at the time invention was made to use an ethylenically unsaturated monomer having 110 or more of the oxyalkylene groups, but not exceeding 300, to accelerate hardening of the concrete and improve surface hydration of cement owing to enhanced dispersing effect due to steric repulsion of long chain oxyethylene groups.

Response to Arguments

8. Applicant's arguments filed 8/21/2008 have been fully considered but they are not persuasive. Specifically, applicant argues that (A) the range of 200 to about 13,200 in claim 2 and the range of 280 to about 11800 in claim 3 encompass the amounts noted in office action; (B) use of monomers V wherein "n" is between 90 and 300 results in improved superplasticizers in that they accelerate cement hydration and improve early strength; (C) applicant refers to graphical representation of the results of example 5 to indicate that the claimed superplasticizer additive results in improved mechanical strength development when "n" is an integer higher than 90.

With respect to (A), applicant's attention is directed to the fact that range in claims 2 and 3 are broader than the amounts that have been calculated based on the "n" values for monomers recited in independent claim 1 and noted in office action mailed on 2/21/2008.

With respect to (B), applicant's attention is drawn to new grounds of rejection in paragraphs 4 and 5 above, necessitated by amendment.

With respect to (C), firstly it is noted that the graphical representation of the data for example 5 was not in the remarks submitted by the applicant. However, because of the office policy for compact prosecution, examiner has looked at the data in originally filed disclosure to evaluate the improved mechanical strength. The data from example 5 is presented below for convenience.

	IE 1	IE 2	CE 1
Monomer V (MW)	180 g (4468)	150 g (10188)	187.3 g (2368)
Monomer V1	4.56 g	3.9 g	4.8 g
Monomer IV	22.65 g	23.3 g	32.7 g
Compressive Strength (14 h)	3.7	6.7	0.6
Compressive Strength (16 h)	4.4	7.5	1.0
Compressive Strength (18 h)	11.0	12.4	1.8

For a proper comparison, trial runs should be conducted in a side-by-side manner. Side-by-side trial runs require that all parameters remain the same with inventive feature being the only variable, which in this case is the length of oxyethylene group of monomer V. Thus, it is not clear if the alleged unexpected results are because of the length of oxyalkylene group resulting from the change in "n" value or other parameters that are varied in the examples referred to in example 5.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARUNA P. REDDY whose telephone number is (571)272-6566. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published

Art Unit: 1796

applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. P. R./
Examiner, Art Unit 1796

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796